

Dorsal three fourths of height of body. Eye small, but distinct. Snout obtuse; lower jaw advancing a little beyond upper. Teeth small, closely set, the outer series much smaller and more closely set than in *A. Broussonetii*. Dorsal and anal connected with caudal. Upper parts dark brown, with a series of white spots along the whole length of the side; lower parts of sides and body white.

One specimen in the British Museum, from Mexico, purchased. Length 1 foot 8½ inches.

BIBLIOGRAPHICAL NOTICES.

Two Bone-Caves in Switzerland.

1. AXON. *The Excavation in the Kesslerloch near Thayingen*: 'Alpenpost,' No. 14, April 4, 1874, pp. 196-199, with 2 woodcuts.
2. Prof. ALBERT HEIM. *On a "Find," of the Reindeer Period, in Switzerland*: Mittheil. antiquarisch. Gesellschaft in Zürich, vol. xviii. Heft 5, 1874, pp. 125-135, with a 4to plate.
3. H. KARSTEN. *Studies of the Primeval History of Man in a Cave of the Schaffhausen Jura*: Mittheil. antiq. Ges. vol. xviii. Heft 6, 1874, pp. 139-162, with 4 4to plates.

I. THE Kesslerloch is a cave piercing a spur of the Jura, about a kilomètre west of the railway-station at Thayingen (or Thäingen), in the Canton of Schaffhausen. It opens to the east on the level of the valley along which the railway passes, and to the south-west at about three mètres higher level. Many similar, but smaller, caves are found in the neighbouring hills of upper white Jurassic limestone. Incited by the discoveries made in the many caves of Germany, Belgium, and France, the two masters of the High School of Thayingen, MM. Wepf and Merk, set to work examining this cave in the Christmas holidays of 1873-74. Having removed 1 to 1½ foot of fragments of limestone, they exposed a black layer, a foot or more thick, full of bones and horns and other remains. Beneath this they came upon a red bed, with black and brown patches in it, over 6 feet thick in one place (down to water), and crowded with small flint knives, cores, and flakes, broken marrow-bones, and other evidences of man's early habitation. One of the most interesting specimens was found in the southern half of the cave, on the top of the red bed, about a mètre below the surface, and consists of a piece of subcylindrical Reindeer-antler bearing an incised life-like outline of a Reindeer grazing. The deposits in the cave were horizontal; but the floor of the cave was found to be much lower near the entrance than further back; and it is thought that the higher part was the habitation, and into the lower part the refuse bones, stones, &c. were flung by the old inhabitants. No definite succession of

relics in the red and black deposits was discerned; they were scattered throughout, and, proving to be of the Reindeer Period, indicate this as one of the oldest of the Swiss caves, like those on the Salève and near Villeneuve. Indeed the lowest bed is supposed to be of the Mammoth Period.

No signs of polishing appear on any of the flint implements; and no pottery has been found as yet. The bones are well preserved, and the joint-ends have not been gnawed; the hollow bones, however, have been broken open. Bones of the Hare are most plentiful; next, those of the Reindeer and Stag, and then the Horse. Bird-bones are not rare, especially of the Ptarmigan. Two bones seem to be referable to the Bison or Aurochs. Single bones were met with of the Fox (?), Hyæna (?), and Bear. Lastly, in the lowest bed were found some fragments of a molar of the Mammoth.

Prof. Heim, describing in full the Reindeer figure engraved on the piece of antler, which is carefully illustrated in the plate accompanying the Memoir, insists upon the bold, free, and exact drawing of the old draughtsman, evidently by no means a beginner in his art, and finds reason to show that he was right-handed. In comparing this work of prehistoric art with those found in the Caves of Périgord, and figured by Lartet and Christy in the '*Reliquiæ Aquitanicæ*,' Prof. Heim notices the superior design and effect of this natural and finished figure, as compared with the outlines of Reindeer from that district; but some known outlines of the Aurochs from Périgord (sketched feebly in the '*Matériaux pour l'Hist. de l'Homme*,' vol. v. pl. 21) have equal vigour and truth, and the carver of such poniard-handles as that figured in the '*Reliquiæ Aquitanicæ*,' B. pl. xx., could really represent the Reindeer with exactness and grace. The Swiss Reindeer under notice, with its pinched-up belly, appears to us to be migrating from a poor feeding-ground, perhaps intent on a fresh pasture. Prof. Heim objects to a disproportionate largeness of the head and smallness of the ear. Possibly its poor condition has attenuated the body; or still more likely, knowing the truthfulness of these old artists in other respects, we may believe that this variety of Reindeer had a large head.

Prof. Heim points to other analogies presented by the contents of the Kesslerloch with those of the caves on the Vézère. Piercers made of bone, and broad sharp-edged implements of bone and antler, fragments of the so-called Batons or Pogamagans, barbed harpoons, and fragments of cut antlers were met with, thus corresponding in many respects with the contents of the caves of the Reindeer Period in the south-west of France.

II. After some remarks on the sudden growth of prehistoric studies and on the possibly rash calculations made as to the antiquity of man, H. Karsten states that, with the view of studying these matters for himself, he sought for a cave near Schaffhausen; and, with his friend Dr. E. Joos, he found one in February 1874 fully

answering his purpose. This cave is in the Freudenthal, a little N.-S. valley, opening on the Rhine near Schaffhausen, in the upper white Jurassic limestone, there dipping 5° S.E. It is scarcely 70 feet above the valley, under a projecting rock on the eastern slope, which is called the Rosenhalde, about 120 feet high, and forming the western edge of the Reyath plateau. The entrance of the cave was nearly blocked up with the débris covering the hill-side; but it proved to be about 4 feet high and wide, and 10 feet long, leading into a large interior, quite dark, about 50 feet long, 6 feet broad in the middle, and 12 feet high, with the floor sinking towards each side, and rising gently from the middle both inwards and outwards, the former slope being due to the rise of the bottom of the cave, whilst the slope near the entrance was due to the incoming of débris from without. Some bones of a Fox and of a Sheep, with a charred stick, lay about the surface.

By successive diggings, with the aid of Dr. E. Joos, Herr Nüesch (of the High School), Prof. Merklein, and a labourer or two, Herr Karsten found the following succession of deposits:—1. Uppermost, 2 feet of loose limestone fragments, with some bones of recent animals scattered throughout, also some few shards of turned pottery, the lowest at $1\frac{1}{2}$ foot depth. On the surface were flakes of limestone, containing flint nodules, loosened by frost from the roof.

2. One foot of similar limestone débris, but mixed with marl, more especially downwards, yellow and grey. It contained some bones of Stag, Roe, Fox, Badger, Boar, Goat, and other recent animals, together with fragments of human bones and pieces of very coarse pottery, more abundant than that in the upper bed, and thus distributed to the depth of from 2 to 3 feet. Only one perfect vessel could be restored from the many scattered shards. This pottery is hand-made, ornamented with nail-marks and such like. It corresponds with that of the pile-villages, and, according to Dr. Keller, is similar to that of the Gallo-Celtic period. No stalagmite was met with in the cave; but between the beds No. 1 and No. 2 there is a local bed of loose white calc-tuff, partly pisolitic, without any stones, 1 foot thick and about 2 square metres in extent.

3. Below the one-foot pottery band is another bed of limestone débris, from 1 to $1\frac{1}{2}$ foot in the back part, and 2 feet thick in the front part of the cave, mixed with much more clay than in No. 2, and, indeed, in the lowest layers half clay. This bed was full of broken bones of man and beasts, the latter either now extinct or gone from the region (Reindeer, Ibex, Horse, &c.), together with Reindeer-antlers, works of art made of antler and of wood, broken flints and flint knives, so called. Entire flints also occurred in great numbers, and partly of a colour different from that in the upper beds, where a flint nearly 4 cubic feet in size was met with. With the bones &c. occurred also a number of pebbles of quartzose and crystalline rocks, some of which apparently had been used for rubbers, having flat rubbed faces; also smoothing- and polishing-stones of quartzose, argillaceous, and calcareous schists; lastly, a

shell of *Pectunculus* (like *P. violaceus* and *P. glycymeris*), smoothed down, and bored at the umbo. In short, says H. Karsten, we found nearly, if not quite, the same conditions as described by De Taillefer and Saussure ('Archives Sc. Phys. Nat.' 1870) at Veyrier and Ville-neuve on the Lake of Geneva, and by Von Fraas at Schussenreid, and quite the same objects, only more sparingly, as were found close by on the south-east side of the Reyath, near Thayingen* ('Neues Jahrbuch für Min. Geol. u. Paläont.' 1874, pp. 265-268). As at the places mentioned, and at many others worked out in the Department of Dordogne and in Belgium, the remains of human households are found in this so-called civilization-bed (Culturschicht), without any trace of pottery, under turf-, tuff-, and breccia-deposits, so at the Rosenhalde this bed yields no evidence at all of the existence and use of cooking-vessels. From the entrance nearly to the middle of the cave this bed was streaked grey and black, and contained a larger proportion of flint knives; and some charcoal, burnt bones, and flat pieces of limestone and sandstone, burnt red, here clearly indicated a fireplace or hearth. At the left side, towards which the beds gently sloped, the implements and chips were particularly abundant. The boundary between this implement-bed (1 foot thick on an average) and the loam beneath is not definite; and probably the early cave-dwellers here trod many of their refuse things into the loam softened in rainy weather by drip-water.

4. This lower loam, brownish yellow in colour, was very thin in the back part, and about a foot thick in the fore part of the cave. It had none of the small angular limestone fragments, but contained numerous irregularly shaped nodules, rough to the touch, and mostly penetrated by crystalline veins. Together with flints and small nodules of Bohnerz (concretionary oxide of iron), these nodules occur of all sizes, and belong apparently to the same category as some very large blocks (one measuring half a cubic mètre) which were noticeable in the upper beds. The flint nodules have a white chalk-like crust, as much as 4 lines thick. Some fragmentary bones and molar teeth of Mammoth found in the cave appear to have come from this bed, if, indeed, they do not belong to the lowest part of the bed with flint knives and reindeer-bones.

5. In the back part of the cave, under the loam was a local deposit of tough white clay, without bones or stones, similar to the mammaliferous fire-clay and pottery-clay on the top of the Reyath.

Among the several subjects of interest discussed in this memoir, the author gives his reasons for believing that the cave-folk were cannibals, on account of the split marrow-bones and the peculiarly fractured condition of a piece of human skull found at the Rosenhalde—thus accepting the conclusions arrived at by Spring studying the Chavaux cave, by Jarrigou on the cave near Montesquieu-Avantes, and by Virchow (Address, 'Naturf. Ver. Wiesbaden,' 1873). Remarks also on the probable history of the several deposits, comparisons of the contents of the Rosenhalde cave with those of the

* See also above, p. 148.

Kesslerloch near Thayingen and other caves, descriptive notes on the several figured specimens of stone, antler, bone, &c., and discussions as to the relative and positive dates of the Cave-dwellers complete the memoir.

The author thinks 4000 years a sufficient period to allow of the habitation of the cave, after the lowest bed with Mammoth-bones had been washed in and the waters drained off, and for the formation of the bed with flint knives and hearth-stuff and subsequent accumulations.

The plates illustrate:—flint-cores and flakes, the latter mostly simple, rarely dressed or worked; simply pointed harpoon-heads, of various patterns and ornament; bone chisels; eyed needle, simple awls and piercers, rippers and smoothers, made of antler; perforated ornaments or charms of wood, shell, and bone; cut antlers; a piece of elephant-bone, and a portion of a human skull fractured by a blunt implement; also a view of the Rosenhalde and diagrams of the cave and its deposits.

Recherches pour servir à l'Histoire Naturelle des Mammifères, comprenant des Considérations sur la Classification de ces Animaux par M. H. MILNE-EDWARDS, *des Observations sur l'Hippopotame de Liberia et des Etudes sur la Faune de la Chine et du Thibet orientale* par M. ALPHONSE MILNE-EDWARDS. Tome premier: Texte. Tome second: Atlas, 105 planches. 4to. Paris, 1868 à 1874.

M. MILNE-EDWARDS proposes another scheme for the arrangement of the Mammalia. Like all these schemes, it contains some good points and shows some affinities; but these multitudes of arrangements are of great detriment to the progress of science.

M. Alphonse Milne-Edwards gives a good figure of the Liberian hippopotamus from life, a figure of its skeleton, and details of its skull, brain, &c., the two latter showing that Morten was quite right in regarding this animal as a distinct species and genus from the common hippopotamus, of which some zoologists consider it only a pygmy race.

M. Alphonse Milne-Edwards describes and figures the following new forms of Mammalia from China and Thibet:—

1. *Rhinopithecus Roxellanae*. A monkey with a slightly elongate recurved nose, from Eastern Thibet.
2. *Ailuropus melanoleucus*. A large black-and-white bear with a very short broad head, from Thibet.
3. *Scaptochirus moschatus*. A genus allied to the mole, from Mongolia.
4. *Nyctogale elegans*. An iridescent water-Insectivore.
5. *Scaptomyx fuscicaudatus*; 6. *Uropsilus soricipes*; and 7. *Anourosorex squamipes*. Allied to the shrewmice.

Besides these, he figures and describes, almost all as new:—two